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ABSTRACT

This manual contains a work sample intended to assess a handicapped student's ability to move the hands easily and skillfully and the ability to move the hands in placing and turning motions. Section 1 describes the assessment and lists related occupations and DOT codes. Instructions to the evaluator are provided in the next section. The conditions and administration equipment are detailed,and the set up and breakdown procedures are illustrated. The section on administration provides a student orientation including student material with an explanation and illustration of equipment and/or procedures. Instructions for task procedures actions to be taken, as well as post sample interview topics are also covered. Section 4 explains the method of scoring and provides forms. Section 5 lists technical data (norms, reliability, validity) to be included in a supplement to this manual. Contents of the section on maintenance and construction include information on tool and equipment maintenance, a materials list (equipment, source, price), and work sample diagrams and/or photographs. Section 7 cites references. An appendix defines terms. (YLB)

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MANUAL DEXTERITY

Work Sample

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I. INTRODUCTION

A. Assessment Description

The Manual Dexterity Work Sample is intended to assess a students ability to move the hands easily and skillfully, and the ability to move the hands in placing and turning motions. The work performed and worker trait group sections do not apply to an isolated trait work sample.

B. Related Occupations

	DOT Code
JUGGLER	159.341-010
VIOLINIST	152.041-010
INSTRUMENT REPAIRER	710.261-010
EGG CANDLER	529.687-074
FABRICATOR ASSEMBLER	809.381-010
DENTAL LAB TECHNICIAN	712.381-018
TOOL MACHINE SET-UP OPERATOR	601.280-054
TIRE BUILDER, AUTOMOBILE	750.384-010
DENTIST	072.101-010
ELECTRONIC ASSEMBLER	726.381-010
POST-OFFICE CLERK	243.367-014

II. INSTRUCTIONS TO THE EVALUATOR

A. Work Sample Conditions

The Manual Dexterity Work Sample is to be administered indoors with only moderate noise from adjacent areas, and good overhead and bench lighting. The sample can be done by a two armed person from a chair or wheelchair. The sample is not physically hazardous in any way and does not require special safety equipment, although precautions regarding Safety and Health requirements should be adhered to.

B. Administration Equipment

The following equipment is needed prior to administration.

Evaluator Equipment:

- Manual for Manual Dexterity Work Sample
- Task Observation Sheet

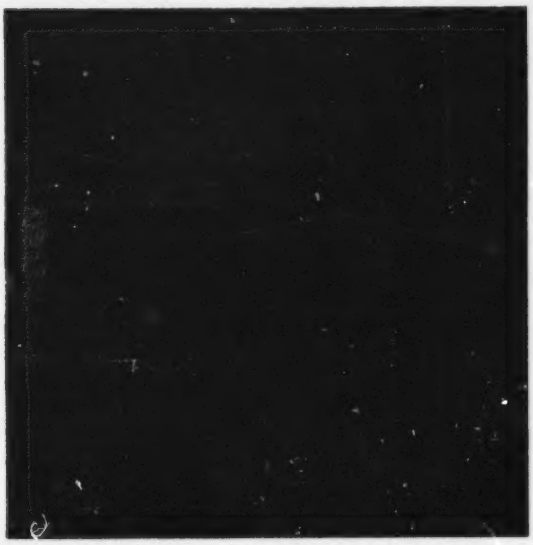
Student Equipment:

- Manual Dexterity Work Sample

C. Set-up and Breakdown

An illustration of the correct set-up and breakdown procedures for the Manual Dexterity Work Sample is shown below.

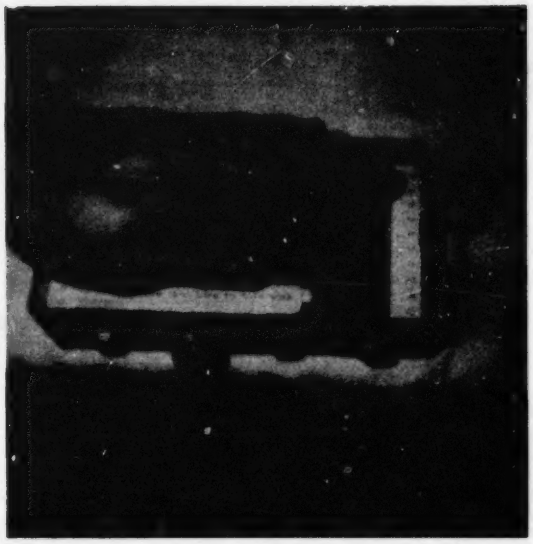
Fig. 1



Manual Dexterity Work Sample in the Start Position

The Sample is placed on the edge of a desk or table closest to the student, who is seated in front of the sample.
The wrench is placed immediately to the right of the Work Sample for a right handed person, to the left for a left handed person.

Fig. 2



Work Sample in Progress, Wrench being applied

While giving instructions and pointing out work, the evaluator stands to the side of the work sample so as not to interfere with the students view of the work. No alterations are required for wheelchair students.

When the sample is completed, the instructor inspects the bolts to see that each has been tightened, then reads and records the numbers beneath the scale indicator on the top left and right sides of the sample.

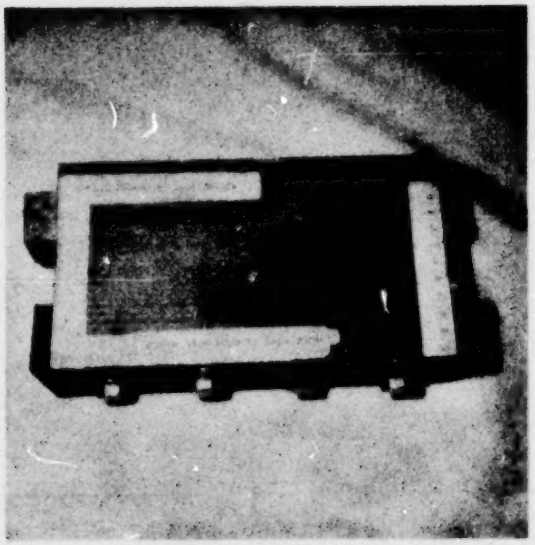
Timing Procedures:

Since time is not of the essence in the Electronics Course, it is not included in the scoring of this work sample, but should be kept for comparison purposes.

Quality Checks:

Quality is checked by comparing the work on each soldered joint to the work on the Task Observation and Scoring Record.

Fig. 3



Method of Reading the Scale on Manual Dexterity Work Sample

III. ADMINISTRATION

A. Student Orientation

Read or paraphrase the following information to the student:

> The work sample that you are about to do is called the Manual Dexterity Work Sample.
> The work you will be doing will be like the work done in many industries, including Automotive Repair, Appliance Repair, Furniture Assembly, and others.
> On this work sample you will tighten bolts located on the front of the work sample.
> I'll show you how to do the work in a minute but first, do you have any questions?

B. *Instructions and Demonstration*

Sighted population

Statement	Action
Place left hand on the work sample in the place marked.	Point to the marker on top of work sample.
Pick up the ½" wrench with the right hand and place it on the first bolt (working from left to right). Tighten the bolt ½ turn clockwise.	Indicate the first bolt.
Repeat this process for each successive bolt.	
Continue to tighten each bolt ½ turn until all bolts are as tight as you can get them.	
When you have finished, call your instructor and tell him. Do you understand the instructions? Go ahead and begin.	

Reassembly in this sample consists of loosening the bolts so that the indicator reads zero on each side. This will release the tension on the springs and the sample will be ready to use at the time of next testing. The evaluator should see that the tool is returned to the storage area.

Post Sample Interview Topics

1. Like or dislike for the tasks.

2. Additional information about work fields in which Manual Dexterity is important.

IV. SCORING

A. Explanations

1. Method of scoring:

Productivity is not considered in scoring this sample.
Quality assessment is based on the number of errors.
For a list of errors see the scoring key.
Work

2. Work Performance factors to be observed:
Student if able to follow verbal directions.

Student has sufficient dexterity to perform the tasks involved.

B. Forms

1. Task observation record.

Task Quality Errors (1 pt. each)

_____ 2. Omits tightening one bolt.

_____ 3. Does not tighten bolt 1 turn in succession.

Observational explanations for 2 and 3.

Put additional comments and observations below.

_____ Critical errors

_____ Task quality errors

_____ Min _____ Sec Total time

_____ Date taken

_____ Evaluator

_____ Student

V. TECHNICAL DATA

A supplement to this manual is being developed at the time of this printing. It will include:

1. Norms
2. Reliability, test-retest studies
3. Validity
   a. Content validity - established through the Course Analysis based on methods suggested by U. S. Dept. of Labor Job Analysis techniques.
   b. Predictive Validity
      To be established through follow-up studies of students previously tested.

VI. MAINTENANCE AND CONSTRUCTION

A. Maintenance

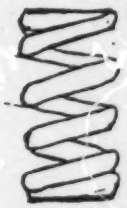
After each administration the evaluator should see that all bolts are loosened so that the scale reads 1 on each side.

B. Materials List

Equipment	Source	Price
1-½" open end wrench	Any hardware store	$1.95
7-3½' X 5/16" hex-head bolts with wing nuts		2.10
7-5/16" flat washers		.15
2-1" # 18 brads	Any school wood shop	free
1-4" rubber band	School secretary	free
5-3½" adhesive backed folder labels	School secretary	free
7-Automotive valve springs	Any auto mech shop	free, used
1-pc hardwood, 1" X 1" X 9"	Burlington Auto Supply	1.20/ new
1-pc. hardwood, 2" X ½" X 8"		
2-pcs. hardwood, 3½" X ½" X 8"		

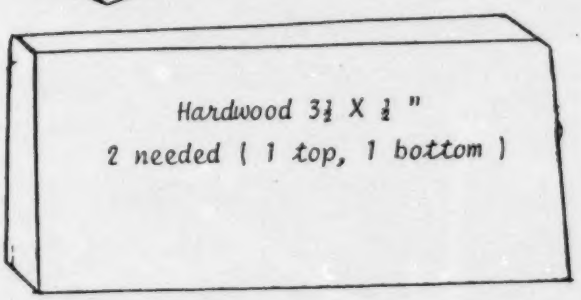
MANUAL DEXTERITY WORK SAMPLE

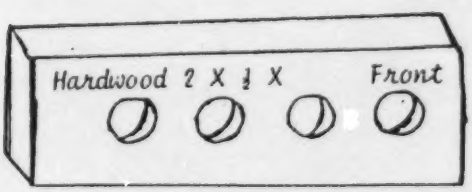
Materials List

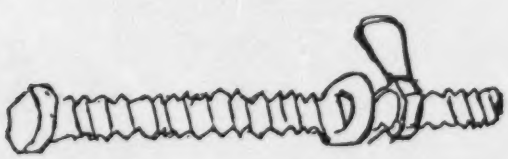


Automotive
Valve Spring

2 ea. 1" X # 18 Brads







ea. 3½ X ¼" Hex-head bolts with wing-nuts and washers.

VII. REFERENCES

Korn, T. (ed.) A Work Sample Style Manual. Interface No. 10. Menomonic, WI.: Research and Training Center, University of Wisconsin - Stout, 1976.

United States Department of Labor, Dictionary of Occupational Titles, 3rd Edition. Washington, D. C.: United States Government Printing Office, 1965.

Handbook for Analyzing Jobs, Washington, D. C.: United States Government Printing Office, 1972.

Occupational Outlook Handbook, 1970-71 Edition. Washington, D. C.: United States Government Printing Office, 1970.

APPENDIX

Definition of Terms

GED - Is the general level of learning and reasoning acquired through schools, experience and self study. There are six GED difficulty levels, ranging from (6) the most difficult to (1) the simplest.

SVP - Is the special vocational preparation and training in terms of the total time required to prepare for an occupation. It ranges from SVP 1, short demonstrations only, to SVP 9, over ten years.

APT - Refers to aptitudes, which is the quickness and ease with which you can learn to do something. Aptitude definitions are included on a separate page in this manual.

WA - Work Activities:

1. Dealing with things and objects.
2. Involving business contacts.
3. Of a routine, definite, organized nature.
4. Involving direct personal contact to help or instruct others.
5. Resulting in recognition or appreciation from others.
6. Involving the communication of ideas and information.
7. Of a scientific and technical nature.
8. Involving creative thing.
9. Involving processes, methods or machines.
10. Involving working on or producing things.

WS - Work situations are the conditions under which the work involved in any occupation takes place. There are ten types described and they have been related to the 66 Worker Trait Groups in the Guide for Occupational Exploration. They are:

1. Performing duties which change frequently.
2. Performing duties of a routine nature.
3. Planning and directing an entire activity.
4. Dealing with people.
5. Influencing peoples opinions, attitudes, and judgements.
6. Working under pressure.
7. Making decisions using personal judgement.
8. Making decisions using standards that can be measured or checked.
9. Interpreting and expressing feelings, ideas, or facts.
10. Working within precise limits or standards.

PD - Physical Demands are the physical requirements of an occupation and are described in six areas as follows:

1. Lifting, carrying, pushing and/or pulling.
2. Climbing and/or balancing.
3. Stooping, kneeling, crouching, and/or crawling.
4. Reaching, handling, fingering, and/or feeling.
5. Talking and/or hearing.
6. Seeing.

WC - Working Conditions are the physical surroundings of a worker in a job. The DOL lists six different types as follows:

1. Inside or outside.
2. Extremes of cold plus temperature changes.
3. Extremes of heat plus temperature changes.
4. Wet and humid.
5. Noise and vibrations.
6. Hazards.

Aptitudes are rated on a scale of 1 - Highest to 5 - Lowest as follows:

1 - Top 10% of the population
2 - Top third not including the top 10%
3 - Middle third of the population
4 - Lowest third not including lowest 10%
5 - Lowest 10%

The following are the definitions of the aptitudes:

G - General Learning Ability - The ability to "catch on" or understand instructions and underlying principles; the ability to reason and make judgements. Closely related to doing well in school.

V - Verbal Aptitude - The ability to understand meaning of words, and to use them effectively. The ability to comprehend language, to understand relationships between words and to understand meaning of whole sentences and paragraphs.

N - Numerical Aptitude - Ability to perform arithmetic operations quickly and accurately.

S - Spatial Aptitude - Ability to think visually of geometric forms and to comprehend the two-dimensional representation of three-dimensional objects. The ability to recognize the relationships resulting from the movement of objects in space.

P - Form Perception - Ability to perceive pertinent detail in objects or in pictorial or graphic materials. Ability to make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.

Q - Clerical Perception - Ability to perceive pertinent detail in verbal or tabular material. Ability to observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation. A measure of speed of perception which is required in many industrial jobs even when the job does not have verbal or numerical content.

K - Motor Coordination - Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. Ability to make a movement response accurately and swiftly.

F - Finger Dexterity - Ability to move the fingers, and manipulate small objects with the fingers, rapidly and accurately.

M - Manual Dexterity - Ability to move the hands easily and skillfully. Ability to work with the hands in placing and turning motions.

MR - Mechanical Reasoning - The ability to understand mechanical principles (pulleys, gears, etc)

E - Eye-Hand-Foot Coordination - Moving the hands and feet together in response to visual signals or observations.

C - Color Discrimination - Seeing likenesses or differences in colors or shades. Identifying or matching certain colors. Selecting colors which go well together.